Syllabus
BT4016: Risk Analytics for Financial Services
National University of Singapore, School of Computing
2025/2026 Semester 2

Assistant Professor Freddy Lim

Office: COM2-04-37
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Office hours: TBC

Classes: Mondays, 4pm – 6pm, LT15
Final exam: 2 May 2026, 9am – 11am (always check official schedule for latest updates)
Tutorials and instructors/TAs: TBC
Assignment grading TA: TBC

Prerequisites:
University level foundation courses in probability, statistics, and calculus are assumed.

Course materials:
1. Main text: John Hull, Risk Management and Financial Institutions, 6th edition
2. Supplementary text: Zvi Bodie, Alex Kane, Alan Marcus, Investments, 13th edition
3. Supplementary text: John Hull, Options, Futures, and Other Derivatives, 11th edition

Course description:
This course covers the fundamentals of risk management in financial institutions. The course will begin with an introduction to financial markets and a general framework for modeling risk and return tradeoffs. We then cover 4 major topics: interest rate risk, value at risk/expected shortfall, derivatives risk, and credit risk.

This course does not assume prior coursework in finance, but assumes university level foundation courses in probability, statistics, and calculus. There may also be some coding involved. We will cover a carefully curated set of fundamental concepts in financial risk management, and construct most of these concepts from first principles in a rigorous manner. We will aim for a deep and intuitive understanding of these concepts so that students can go on to more advanced classes with a good foundation.

Course grading:
1. Participation (5%)
   You will get participation scores if you complete short course surveys that are sent out during the semester. These surveys will help me to improve the course.

2. Assignments (30%)
   There will be 9 individual assignments in this course. Each assignment corresponds to a class topic, and is due one week later. **Late submissions will receive zero grades.** The assignments are meant to incentivize and encourage consistent work,

so that you do not fall behind on the content. As such, grading will be mainly based on effort.

We will drop your 2 lowest assignment scores, i.e., only your best 7 out of 9 assignments count. This will account for any unforeseen circumstances that may result in you missing work for a couple of weeks.

3. <u>Midterm test (25%)</u>
   The midterm test is an **open-book** test, scheduled during class time in Week 7. The midterm test is meant to be easier and more straightforward than the final exam, and serves as a midpoint check to ensure that you have understood the fundamental concepts in the first part of the course. More details for the midterm test will be communicated later during the course.

4. <u>Final exam (40%)</u>
   The final exam is an **open-book**, written paper exam. Only calculators are allowed; all other electronic computing devices are prohibited. The final exam is comprehensive, and covers all topics including those already tested during the midterm test.

Honor code:
All university level codes of conduct apply. Most of it is just common sense – do not cheat or plagiarize. Any violations will be escalated to university administration and will be dealt with harshly.

Course roadmap:

Week	1	2	3	4	5	6	Reading	7	8	9	10	11	12	13	Reading	Exams
Dates	12 Jan - 16 Jan	19 Jan - 23 Jan	26 Jan - 30 Jan	2 Feb - 6 Feb	9 Feb - 13 Feb	16 Feb - 20 Feb	21 Feb - 1 Mar	2 Mar - 7 Mar	9 Mar - 13 Mar	16 Mar - 20 Mar	23 Mar - 27 Mar	30 Mar - 3 Apr	6 Apr - 10 Apr	13 Apr - 17 Apr	18 Apr - 24 Apr	25 Apr - 9 May
Classes	Intro, Financial markets	Risk & return, CAPM	Interest rate risk 1	Interest rate risk 2	Interest rate risk 3	*No classes (CNY eve)*	*No classes*	Midterm test during class time	Value at risk/expected shortfall 1	Value at risk/expected shortfall 2	Derivatives risk 1	Derivatives risk 2	Credit risk	Course recap	*No classes*	*No classes*
Tutorials			✅	✅	✅	✅ (recorded due to CNY)		*No tutorials*	*No tutorials*	✅	✅	✅	✅	✅		
Assignments (30%) (Drop 2 lowest scores; Due in 1 week.)		W2	W3	W4	W5				W8	W9	W10	W11	W12			
			W2 due	W3 due	W4 due	W5 due				W8 due	W9 due	W10 due	W11 due	W12 due		
Midterm test (25%)								Midterm test								
Final exam (40%)																Final exam
Participation (5%)	Short course surveys will be sent out over the semester. Submit these to get participation grades.															